

NEW NORTH AMERICAN CHILOPODS AND DIPLOPODS.

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CLASS CHILOPODA.

Family LITHOBIIDÆ.

Genus *Arenobius* Chamberlin.

Arenobius coloradanus sp. nov.

Dorsum from testaceous to dark brown and dull chestnut with the posterior plates and the first one usually not all darkened. Head mostly the same color as dorsum or very nearly so, or somewhat more reddish. Antennæ concolorous with head, pale distad. Venter from yellow or testaceous to dark brown, the caudal plates usually a little darker. Prosternum and prehensorial feet of same color as head or nearly so. Legs of same color as adjacent portion of venter.

Head widest at level of marginal interruptions; clearly wider than long (11: 10); caudal margin straight. Depressed or furrowed parallel with frontal suture a little cephalad of the latter, from this furrow a median longitudinal furrow extending toward anterior margin. Two, usually clearly impressed, longitudinal furrows on caudal region of head, one a little each side of the middle and the two united in front of the posterior margin by a transverse furrow. Smooth and shining.

Dorsal plates all very finely or obscurely roughened, appearing smooth and shining to the naked eye; usually no furrows distinctly developed excepting the usual depression or furrow immediately within the caudal and lateral margins and on some the short transverse mark on each side near margin at about one-third length of plate from caudal margin. Posterior angles of ninth, eleventh and thirteenth dorsal plates strongly produced; posterior angles of other minor plates rounded or obliquely excised.

Ventral plates all punctate and finely roughened; impressed with three longitudinal furrows of which the median is most distinct, the latter on some of the more posterior plates ending caudad in a deeper pit or depression about one-third the length of plate from caudal edge; mostly with a rather wide transverse depression or furrow caudad of middle of plate. Sometimes an additional longitudinal furrow showing on each side between the median and the lateral, the caudal end often curving mesad to unite with its mate at middle; this furrow often more or less united with the lateral one. The last several plates sometimes with furrows very obscure or practically absent.

Antennæ short or very short, reaching the sixth or seventh segment; articles 30 to 35, the second very long with those more distad much shorter, cylindric, subuniform or, more usually, with longer articles occurring singly at intervals among the shorter ones, in general decreasing in size distad. Hairs of medium length.

Eyes composed mostly of from 9 to 12 ocelli arranged in three series; e. g., 1+ 3, 3, 2, 1+ 4, 3, 3, 1+ 4, 4, 3. The single ocellus much largest, subvertically elliptic or oval.

Prosternum about 1.6 times wider than long. Teeth 2+2, small acute. Median incision wide and moderately deep, its sides concave. Spine on each side well ectad of outer tooth, much more slender than teeth but stouter at base than neighboring hairs, bristle like distad.

Coxal pores circular, well separated; in number arranged as follows: 3, 4, 4, 3; 3, 4, 4, 4; 4, 5, 5, 5.

Coxæ of anal legs armed laterally and dorsally; other coxæ seemingly unarmed. Spines of first legs $\frac{0, 0, 2, 1, 1}{0, 0, 1, 2, 1}$ or $\frac{0, 0, 2, 1, 1}{0, 0, 1, 3, 1}$; of the second and third $\frac{0, 0, 2, 2, 1}{0, 0, 2, 3, 1}$; of the fourth $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 1}$ or, occasionally, $\frac{0, 0, 3, 2, 1}{0, 0, 2, 3, 1}$; of the fifth $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 1}$; of the sixth to the eleventh, $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 2}$; of the twelfth and thirteenth, $\frac{0, 0, 3, 2, 2}{0, 0, 3, 3, 2}$; of the penult, $\frac{0, 0, 3, 2, 2}{0, 1, 3, 3, 2}$ in the female, or $\frac{0, 0, 3, 2, 1}{0, 1, 3, 3, 2}$ in the adult male, each having claw armed with two accessory claws; of anal, $\frac{1, 0, 3, 2, 1}{0, 1, 3, 3, 1}$, the dorsal spine of tibia and also outer one of femur readily lost so that spining may appear thus, $\frac{1, 0, 3, 2(1) 0}{0, 1, 3, 3, 1}$, two accessory claws present as in the penult pair. In the female the anal legs are short and very slender, decreasing gradually in diameter from the femur distad, the tibia being intermediate in diameter between femur and first tarsal article as the latter is between tibia and second tarsal article; tibia rather weakly longitudinally furrowed along dorsal surface. Penult legs similar to anal except for smaller size. In the male the anal legs are also rather slender but the tibia is crassate, being fully as thick as the femur and being widest at distal end and abruptly thicker than the first tarsal joint, its dorsal surface shallowly depressed, a longitudinal dorsal furrow also present on femur and prefemur, that of the latter less distinct. Penult legs of male also slender, with joints dorsally longitudinally furrowed; the tibia obliquely excised at dorso-caudal corner of distal end and bearing at this place a small, flattened lobe or crest which is transverse to the axis of the joint, this lobe bearing a few short hairs but nothing like the brush in manegitus.

Gonopods of male relatively wide, flattened, truncate distad; bearing mostly 4-6 bristles in a transverse row along distal edge of ventral side.

Gonopods of female with claw entire, long and stout, acutely pointed, considerably curved, darkened distad. Basal spines 2+2, subequal or with the inner in some individuals considerably shorter, stout; in ventral view acutely conical in outline. Articles, especially the second and third, glabrous or nearly so on ventral and mesal surfaces, but clothed with a moderate number of bristles on ectal and dorsal surfaces.

Body rather slender being about 7.5 times as long as width of tenth plate; conspicuously attenuated cephalad from eighth plate, with the first plate much narrower than the third. Width of head, first, third, eighth and tenth dorsal plates to each other as 40, 33, 37, 47 and 47, the eighth and tenth plates being equal and manifestly considerably wider than the head.

Length from 12 to 15 mm. A male 13 mm. has antennæ 5 mm. long and anal legs exclusive of coxa, circa 4.8 or 5 mm. long, with the tenth plate about 1.7 mm. wide.

Locality: Manitou, Colorado (author, Aug., 1910).

***Arenobius sontus* sp. nov.**

Brown to deep mahogany. Head in some degree darker than dorsum. Antennæ chestnut, paler distad. Prosternum brown to mahogany, paler than head. Venter testaceous to deep brown, the caudal plates darkest. Legs testaceous to brown, the posterior pairs darker with their tarsi usually paler.

Head and first dorsal plate smooth and shining; other dorsal plates rugose, the more caudal ones more strongly roughened than the anterior ones.

Antennæ of moderate length, reaching the seventh segment. Composed of from 40 to 50 articles which beyond the first ones become short, often showing an alternation of a very short article with longer ones in groups between.

Eyes composed of mostly 9 to 12 ocelli arranged in three series; thus, 1+3, 4, 2.

Prosternal teeth 2+2, the two fused at base in a dental plate, the inner larger than the outer and both much stouter than the ectal spines which, nevertheless, is stout and tooth-like and not at all bristle-tipped.

Coxal pores circular decreasing markedly in size proximad, the most distal being large; in number and arrangement, 5, 5, 5, 4; 5, 5, 5, 5; 6, 6, 6, 5, etc. None of the posterior coxæ armed laterally. Spines of first legs, $\frac{0, 0, 2, 1, 1}{0, 0, 1, 3, 2}$ or $\frac{0, 0, 2, 1, 1}{0, 0, 1, 2, 2}$, of second $\frac{0, 0, 2, 2, 1}{0, 0, 2, 3, 2}$; of third to sixth, $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$; of seventh and eighth, $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 2}$; of ninth and tenth, $\frac{0, 0, 3, 2, 2}{0, 0, 3, 2, 2}$; of eleventh, $\frac{1, 0, 3, 2, 2}{0, 0, 3, 3, 2}$; of twelfth, $\frac{1, 0, 3, 2, 2}{0, 1, 3, 3, 2}$; of penult, $\frac{1(2), 0, 3, 2, 2}{0, 1, 3, 3, 2}$; of anal, $\frac{1(2), 0, 3, 2, 1}{0, 1, 3, 2, 1}$, with two claws, the penult having three. As noted in the formulæ, the dorsal spine of the posterior coxæ is frequently replaced by two situated close together. The anal legs of the male slender, the tarsal joints especially slender; tibia bearing near distal end of its mesal surface toward dorsal side a small, flattened, subtriangular lobe or crest the long axis of which is parallel to that of the joint and its higher end caudad, its mesal or long edge somewhat convexly curving. Penult legs slender bearing no special lobes.

Gonopods of male rather large and broad, conspicuously exposed; distally rounded, bearing about ten or twelve long bristles.

Gonopods of female with claws very long and stout, moderately curved. First article excavated on mesal side toward base as usual, this side strongly chitinized as usual. Basal spines 2+2, large and stout, well separated, the outer larger than the inner on each side.

Gradually and considerably attenuated cephalad, the first plate narrowest as usual.

Length from 22 to 30 mm. A male 26 mm. long has antennæ 11 mm. long and anal legs as 9.5 mm. long with its tenth plate as 3.1 mm. wide.

Locality: Mexico (Guadalajara and Tuxpan).

Genus **Guambius** gen. nov.

Type.—*Lithobius euthus* Chamberlin.

Other known species belonging to this genus are *pinguis* Bollman, *curtior* Chamberlin and *mississippiensis* sp. n. described below.

Guambius mississippiensis sp. nov.

Dorsum dilute chestnut, with the caudal plates and a median longitudinal line somewhat darker. Head and antennæ dark chestnut, the latter paler distad. Venter testaceous, darker brown caudad. Prosternum and prehensorial feet nearly the same as head. Legs testaceous, the caudal pairs a little darker.

Head slightly wider than long (36: 35 or 34.5); widest at marginal interruptions, between which and the eyes the diameter is nearly uniform, the sides caudad of this convex and strongly converging; the median portion of caudal margin straight. Rather strongly transversely furrowed or depressed immediately in front of caudal marginal thickening, the furrow extending entirely across head and continuous with caudal ends of a wide longitudinal furrow extending cephalad dorsal of level of eyes on each side. A short transverse sulcus a little cephalad of and parallel with median part of frontal suture, a median longitudinal sulcus extending forward from this transverse one and showing or passing through a deeper pit-like impression at middle of length. Smooth and shining, or only very obscurely uneven.

Dorsal plates finely roughened. Major plates, excepting the seventh, showing distinctly the short transverse submarginal sulcus on each side about beginning of caudal third of plate, the seventh plate showing a similar sulcus near each caudal corner and one near each anterior corner as well. Most of the major plates marked with two distinct longitudinal sulci which diverge more or less from near the caudal margin cephalad, these sulci in some distinct only cephalad of the submarginal transverse marks. Posterior angles of eleventh and thirteenth plates a little produced, those of others rounded or obliquely excised.

Most ventral plates with a rather deep longitudinal furrow toward each side but mesad of a weaker submarginal furrow also present. The usual median longitudinal furrow with also the transverse depression cephalad of caudal margin also more or less evident.

Antennae very short, reaching to or nearly to the sixth segment; articles 25, of which the second is longest, those immediately following not abruptly shorter but only very gradually decreasing in size distad.

Eyes about 11 to 14 in number, arranged in four series; thus, 1 + 5, 4, 3, 1 and 1 + 4, 3, 2, 1. The single ocellus much the largest, sub-vertically elliptic or oval.

Prosternum 1.5 times wider than long or slightly more. Teeth 2 + 2, subequal, acute, with line of apices manifestly recurved. Median incision rather wide and deep with its sides concave. Ectal spines much more slender than the teeth, bristle-like distad, acute.

Coxal pores circular, of moderate size; in number, in type specimen, 3, 4, 4, 3.

No spines of posterior coxae evident. Spines of first legs $\frac{0, 0, 1, 1, 1}{0, 0, 1, 2, 1}$; of second, $\frac{0, 0, 1, 2, 1}{0, 0, 1, 2, 1}$; of third, $\frac{0, 0, 1, 2, 1}{0, 0, 1, 2, 1}$ or $\frac{0, 0, 1, 2, 2}{0, 0, 1, 3, 1}$; of fifth and sixth, $\frac{0, 0, 1, 2, 2}{0, 0, 1, 2, 2}$; of seventh, $\frac{0, 0, 1, 2, 2}{0, 0, 2, 2, 2}$; eighth to tenth, $\frac{0, 0, 2, 2, 2}{0, 0, 2, 2, 2}$; eleventh, $\frac{0, 0, 2, 2, 2}{0, 0, 2, 2, 2}$ or $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$; of twelfth, $\frac{0, 0, 3, 2, 2}{0, 0, 2, 2, 2}$; of thirteenth, $\frac{0, 0, 3, 2, 2}{0, 1, 2, 3, 2}$; of the penult, $\frac{0, 0, 3, 1(2), 0(1)}{0, 1, 3, 3, 1}$, armed with two claws; of the anal $\frac{0, 0, 3, 2, 1}{0, 1, 3, 3, 1}$, claws in type broken off. The anal legs of male strongly crassate, the prefemur particularly elevated dorsally; femur conspicuously excavated dorsally, the excavation extending from end to end as a broad and rather deep furrow; the tibia much less swollen than the femur, complanate or shallowly furrowed longitudinally on dorsal surface; hairs short and straight, more numerous on dorsal surface of all joint but nowhere dense or forming bunches; articles not laterally furrowed. Penult legs crassate in about same degree as the anal but the tibia relatively larger; distal end of tibia obliquely excised at dorso-caudal corner and bearing there a triangular plate or keel-like lobe which lies longitudinally with the elevated end caudad; prefemur, femur and tibia longitudinally furrowed above, but the furrow of femur scarcely more developed than that of the other articles and this article not otherwise especially modified; none of articles bearing bunches of hair, the latter being everywhere sparse; tarsal joints abruptly more slender.

Gonopods of male wide, truncate distad, flattened in an ecto-ventral dorso-mesal direction; bearing a few short bristles in a row along distal edge of ventral side.

Body strongly narrowed from eight plate forward to the first which is clearly narrower than the third; the eighth and tenth plates of equal width and much wider than the head, the latter in type being even slightly narrower than the third plate. Body about $7\frac{1}{4}$ times longer than width of tenth plate.

Length of type (a male) 12.5 mm.; of antennae 5 mm.; width of tenth plate 1.7 mm. Width of head, first, third, eighth, and tenth plates to each other about as 18, 17, 19, 24 and 24.

Locality: Byram, Mississippi (author, July, 1910).

In ANNALS ENT. SOC. AMERICA, 1911, p. 43 the type of the species was referred tentatively to *A. aedipes* Bollman, but study of the type of the latter shows it to be clearly distinct.

Genus *Gosibius* Chamberlin.

Gosibius monicus sp. nov.

Dorsum brown, with a darker median longitudinal stripe which shows a marked tendency to spread laterally at the caudal end of each plate and often reaches the lateral margins across the caudal border. Head ferruginous; the median longitudinal stripe of dorsum continuing forward upon the head as far as a little caudad of the frontal suture where it ends abruptly at a pale transverse band. Antennæ ferruginous. Prosternum and prehensorial feet pale ferruginous. Venter yellow or testaceous, the caudal segments darker, more reddish or ferruginous. Legs yellow or testaceous like the venter, nearly uniform, or the caudal pairs slightly darker dorsally.

Head subcordate, wider than long in about ratio 47: 45. Caudal margin mesally gently incurved; sides conspicuously converging from the lateral interruptions caudad about the rounded corners. A median longitudinal sulcus extending forward from frontal suture to a transverse depression between the antennæ, narrow and not very deep. A short, deep, transverse sulcus a little in front of median portion of caudal margin, the same being more weakly indicated farther laterad on each side. Smooth and shining, not punctate or roughened.

First dorsal plate smooth and shining like the head, or very obscurely roughened. Other dorsal plates more or less roughened, the more caudal ones most strongly so. Major plates with the short transverse sulcus adjacent to each lateral margin at about one-third its length from caudal end, the seventh having in addition a similar sulcus near the middle of length. A median longitudinal furrow on each side between middle and lateral margin which may be indistinct, especially on caudal portion of plate; this furrow at about beginning of middle third of length sending off a more clearly impressed branch directly mesad which may be united with the corresponding furrow from the other side; often a short sulcus running from near anterior margin obliquely ecto-caudad toward point of origin of this transverse furrow.

Ventral plates apparently smooth and shining; the usual three longitudinal impressions indicated in varying degrees of distinctness. On several of the caudal plates the median furrow may end caudad in a deeper, pit-like and somewhat transverse, depression a little in front of caudal margin of plate.

Antennæ long. In types tips are broken off so that full number of articles can not be ascertained; but the number present indicates that the full number is somewhere above 29.

Eyes in types from 15 to 17 in number, arranged in four series; thus, 1+4 (5), 4, 4, 2; 1+4, 4, 4 (3), 4.

Prosternal teeth 2+2, stout, conical, much closer together than in paucidens and also larger, but the proportion of anterior margin occupied larger than in that species. Ectal spines long and distally drawn out into slender, bristle-like, acute tip; the tubercles contiguous with outer tooth and not well removed from it as in paucidens.

Coxal pores circular, rather small; 4, 3, 3, 3, in the types.

Last four pairs of coxæ laterally armed. Spines of first legs, $\frac{0, 0, 2, 2, 1}{0, 0, 2, 3, 2}$; of second, $\frac{0, 0, 3, 2, 1}{0, 0, 2, 3, 2}$; of the third and fourth, $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 2}$; of the fifth to ninth, $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 3}$; of the tenth, $\frac{1(0), 3, 2, 2}{0, 0, 3, 3, 3}$; of the eleventh, $\frac{1, 0, 3, 2, 2}{0, 0, 3, 3, 3}$; of the twelfth and thirteenth, $\frac{1, 0, 3, 2, 2}{0, 1, 3, 3, 3}$; of the penult, $\frac{1, 0, 3, 2, 2}{0, 1, 3, 3, 2}$, armed with two (3?) claws; of the anal, $\frac{1, 0, 3, 2, 2(1?)}{0, 1, 3, 3, 1}$, armed with two claws. Anal legs in the female short and moderately slender, the dorsal surface of femur and tibia distinctly longitudinally furrowed, the same articles of penult legs similarly but less strongly furrowed.

Gonopods of female with the claw long and acute, strongly curved and chitinized. Proximal article excavated at base on mesal side, leaving a conspicuous lobe at distal end which projects mesad and meets the corresponding lobe of other gonopod; the caudal and mesal sides of this articles strongly chitinized as usual. Basal spines 2+2, stout, the inner smaller than the outer. Median process of sternite first clavately widening caudad, and then attenuated to a slender acute point.

Length of types 14 to 15 mm. A specimen (female) 14 mm. long has anal legs 5.8 mm. long and the tenth dorsal plate 2 mm. wide, the body being thus seven times as long as the width of this plate. The body moderately narrowed cephalad and the first plate slightly narrower than the third whereas it is wider in paucidens. The widths of head and first, third, eighth and tenth dorsal plates to each other about as 53, 47, 48, 57, and 57.

Locality: Santa Monica, California (author, June, 1909).

Genus *Lithobius* Leach.

Lithobius devorans sp. nov.

Dorsum from brown to chestnut and, in largest individuals in full color, almost mahogany. In lighter individuals the head is chestnut and clearly darker than the dorsal plates excepting the first in some in which it may approach the same color; in the more deeply colored individuals the head is deep chestnut or mahogany of scarcely deeper shade than that of dorsal plates. Antennæ chestnut, usually paler at very tips only. Prosternum chestnut, the prehensorial feet more rufous. Venter fulvous to brown, the caudal plates always darker and either reddish or very deep brown. Legs colored like contiguous portion of venter, the caudal pairs being thus always darker.

Head slightly wider than long (72:70). Caudal margin straight or nearly so; posterior corners conspicuously and widely rounded, the

sides immediately in front of them but little excurved, diverging forward to the lateral interruptions which are distinct. The short curved transverse submarginal sulcus opposite interruption of each side evident. The usual semi-circular impression on caudal portion clearly marked. There is also present a transverse sulcus immediately caudal of and subparallel with frontal suture, the sulcus being most distinct at the sides. Surface sparsely punctate and moderately uneven.

Posterior dorsal plates conspicuously roughened; the anterior ones less strongly so and the first uneven only in about same degree as head. The short transverse sulci most distinctly impressed on the more caudal plates, mostly weak on the anterior ones. Caudal plates with short hairs more numerous than on the anterior. Posterior angles of the seventh, ninth, eleventh and thirteenth dorsal plates strongly produced; processes of ninth, eleventh and thirteenth long and acute, those of the seventh obtusely rounded, the inner or mesal edges being convex and long with its ectal or distal portion nearly transverse.

Anal segment in the male densely clothed above with rather long hairs, most of which are curved or uncinat at tips, this being a very characteristic feature of the species. In the female the dorsal hairs of this segment are sparse and straight.

The three longitudinal sulci of ventral plates distinct, being on most broadly and deeply impressed to a little in front of caudal margin. Last plate more densely clothed with short hairs. Sternite of genital segment also densely clothed with hairs especially in the male.

Antennæ reaching the beginning of the eighth segment; attenuated, very slender distally. Composed of mostly from 32 to 35 articles which, distad of the first few, are rather short, considerably shorter ones occurring at intervals among longer ones as in related species.

Eyes composed of from 28 to 42, but mostly from 30 to 36, ocelli which are arranged in from 5 to 8 series; e. g., 1+3, 4, 6, 6, 6, 5; 1+3, 4, 6, 6, 6, 3; 1+6, 5, 6, 5, 4, 4, 4; 1+6 5, 6, 5, 5. Single ocellus moderately large, oval. All seriate ocelli deeply pigmented excepting those of first row which are commonly paler as in related species. Of seriate ocelli the caudal ones of first row are clearly the largest.

Prosternum about 1.7 times wider than long. Distance between chitinous spots 1.8 times the width at level of bottom of mesal incision, and 2.5 to 2.7 times as great as length of dental line, the variation depending on number of teeth. Teeth 5+5 or 6+6, or occasionally 5+6; distally narrowly rounded. The prosternal spine situated immediately ectad of outer tooth as usual, slender and bristle like, and curved as in voracior.

In larger specimens the coxal pores are very large and strongly transverse, while in the smaller adults the form may approach that of the pseudomaturus stage, being transversely elliptic and with those at ends of rows often subcircular. In number and arrangement from 6, 6, 6, 5 to 8, 8, 8, 7, other arrangement noted being 6, 7, 7, 6, to 7, 7, 7, 5, and 7, 8, 8, 6.

Last three pairs of coxæ laterally armed. Spines of first legs, $0, 0, 3, 2, \frac{1}{2}$; of the second, $0, 0, 3, 2, \frac{1}{2}$; of the third, $0, 0, 3, 2, 2$ or $0, 0, 3, 2, 2$; of the fourth and fifth, $0, 0, 3, 2, 2$ or $0, 0, 3, 3, 2$; of the sixth to the eleventh, $0, 0, 3, 2, 2$; of the twelfth, $1, 0, 3, 2, 2$, the thirteenth being the same; of the penult, $\frac{1}{2}, 0, 3, 1, 0$ or $\frac{1}{2}, 0, 3, 2, 1$, the anterior or ectal dorsal spine of the fourth joint in the latter case being mostly very small, claws two or three, in latter case the anterior accessory being very small; of anal, $\frac{1}{2}, 0, 3, 1, 0$, the claw single.

The anal legs in the male are short. Fourth article considerably thickened, more so than in *voracior*; dorsal or dorso-mesal surface conspicuously bowed ventrad or depressed over middle and posterior portion, or the depression often almost strictly mesal, longitudinally furrowed along depressed surface; also longitudinally furrowed along dorsal surface toward ectal edge of latter. Third and fourth articles rather deeply sulcate longitudinally on ventral surface. Tibia longitudinally furrowed dorsally. Tarsal joints not clearly sulcate mesally. Penult legs very similar to anal but the fourth article but slightly enlarged and not at all excavated meso- or caudo-dorsally, though the dorsal longitudinal furrow is conspicuous.

The single article composing the gonopod of male well exposed; directed caudo-ectad; sides nearly parallel; distally subtruncate; bearing mostly about four bristles. In the gonopods of the female the claw is comparatively short; strongly bent; tripartite, the three lobes distinct, the median being considerably larger much as in *vorax* but not so greatly exceeding the lateral as in *mordax*, etc. Basal spines stout and moderately long; mostly uniformly attenuated from base to apex. Mesal side of first article straight, diverging cephalad from mesal side of fellow but little.

Body appearing to vary considerably in relative width, the length being mostly as much as eight times longer than width of tenth plate, but in some falling a little below this (7.75) and in others as much as 8.4 times longer. Moderately attenuated cephalad from eighth plate, with the first plate a very little wider than the third and usually a little narrower than the head, occasionally as wide as latter; the average ratio of widths of head, first and tenth plates is 30:29:35. In one male the widths of head and first, third, eighth, tenth and twelfth dorsal plates stand to each other as 72, 72, 70, 78, 78, and 72.

Length from 18 to 26 mm. A male 25 mm. long has antennæ about 12.5 mm. long, anal legs 8.5-9 mm. long and the tenth dorsal plate 2.9 mm. wide.

Locality: Jackson, Alabama (author, 1910).

This species is very close to the next, *L. voracior*. Usually both sexes of fully grown specimens of these species are to be distinguished quite readily by the form of the coxal pores

these in voracior being circular or broadly elliptic whereas in devorans they are larger and mostly strongly transverse. In some cases, however, it is difficult to separate the females, although the males are always very readily distinguished by the character of the hair clothing the anal segment dorsally, this in devorans being long and dense with nearly all the hairs uncinata distally whereas they are all straight in the other species. Devorans averages larger. It is relatively more slender and the width of the head as compared with that of the tenth plate is as 60:70 on an average whereas the average corresponding ratio in voracior is 60:65.5

***Lithobius voracior* sp. nov.**

Dorsum brown, the first plate and the several most caudal ones commonly darker and more reddish of chestnut; plates often showing three longitudinal pale lines. Head conspicuously darker than the dorsum, cherry red or chestnut, or in others often very dark, nearly mahogany. Antennæ chestnut, much lighter distad. Prosternum dark brown or dilute brownish chestnut, with the prehensors paler. Venter yellowish brown, the posterior plates much darker, burnt brown. Legs yellowish brown, the posterior pairs darker, being often somewhat chestnut with distal articles a little paler.

Head wider than long. Widest immediately back of eyes. Sides rather strongly convex and converging caudad of the well marked marginal breaks to the rounded posterior corners. Caudal margin nearly straight or but slightly incurved mesally. The usual subcircular impression on caudal portion. Surface subsparingly punctate, the punctæ varying in size but mostly fine; obscurely uneven.

First dorsal plate with surface similar to that of head. All finely punctate. Plates roughened more especially the caudal ones as usual, the elevations or irregular tubercles small. Posterior angles of seventh, ninth, eleventh and thirteenth dorsal plates strongly produced, processes of the seventh much as in devorans.

Anal segment in male dorsally densely clothed with rather long and strictly straight hairs, these not being at all distally curved or uncinata. In the female the dorsal hairs of this segment are but sparse.

Ventral plates densely punctate and with numerous fine impressed lines which mostly run out from the punctæ. The usual longitudinal furrows clearly developed. Hairs of posterior plates more numerous and longer.

Antennæ of moderate length, reaching mostly to the end of the seventh or beginning of eighth segment. Attenuated considerably but the distal portion not very fine. Articles beyond the first several rather short. Hairs moderately long. Articles in number from 32 to 36.

Eyes composed mostly of from 30 to 35 ocelli, rarely as few as 23, arranged in from 5 to 7 longitudinal series; e. g., 1+3, 5, 5, 5, 4; 1+3, 4, 5, 6, 5, 4, 2; 1+5, 5, 6, 6, 4, 3; 1+3, 5, 6, 6, 6, 4, 3; 1+4, 6, 7, 6, 5, 4, 1.

Single ocellus large subvertically oval. Ocelli of most dorsal row larger and paler as in related species.

Prosternum 1.6 times wider than long. Distance between chitinous spots 1.9 times wider than long of prosternum at level of bottom of mesal incision; 2.3 or 2.4 times as great as length of dental line usually, this varying with number of teeth present. Prosternal teeth 6+6 to 8+8, other numbers noted being 6+7, 7+7, and 7+8; either uniform or varying irregularly in size; subacute, being but narrowly rounded at tips. Spine proximally clearly stouter than the hairs, but distally bristle-like, curved; situated immediately ectad of outer tooth.

Coxal pores transversely elliptic or in part subcircular; of medium size; in largest specimens more strongly transverse as in the preceding species. In number from 6, 6, 6, 4 to 8, 8, 8, 6, other arrangements frequently noted being 6, 7, 7, 5; 6, 7, 6, 5; 6, 6, 6, 5; 7, 7, 7, 6, and 7, 8, 8, 7.

Last three pairs of coxæ laterally armed. Spines of first legs, $\frac{0, 0, 3, 2, 1}{0, 0, 2, 3, 2}$; of second, $\frac{0, 0, 3, 2, 1}{0, 0, 2, 3, 2}$; of third, $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 2}$; of fourth to eighth, $\frac{0, 0, 3, 2, 2}{0, 0, 3, 2, 2}$ or $\frac{0, 0, 3, 2, 2}{0, 0, 3, 3, 2}$; of ninth to eleventh, $\frac{0, 0, 3, 2, 2}{0, 0, 3, 3, 2}$; of twelfth, $\frac{1(0), 0, 3, 2, 2}{0, 1, 3, 3, 2}$ or $\frac{1(0), 3, 2, 2}{0, 9, 3, 3, 2}$ a spine sometimes borne by trochanter of one leg while absent from the other; of thirteenth, $\frac{1, 0, 3, 2, 2}{0, 1, 3, 3, 2}$; of penult, $\frac{1, 0, 3, 1, 1}{0, 1, 3, 3, 2}$ or $\frac{1, 0, 3, 2, 1}{0, 1, 3, 3, 2}$, the anterior spines of fourth joint in latter case being mostly very small, tarsi ending in three claws but the anterior accessory one mostly minute as in related species; of anal $\frac{1, 0, 3, 1, 0}{0, 1, 3, 3, 1}$, the claw single.

Anal legs in female short and rather slender; the third, fourth and fifth articles longitudinally sulcate dorsally, the fourth being most deeply so; the third and fourth articles sulcate ventrally. Penult legs similarly but less strongly sulcate. In the male the penult legs are as in the female; but the anal legs are more strongly modified. Fourth article with dorsal surface depressed or bowed ventrad over middle and proximal portion; relatively thicker than in female; articles longitudinally sulcate along mesal surface, especially so in the more distal ones.

Gonopods of male rather small; distally strongly rounded or broadly subconic; bearing 6 or 7 long bristles.

Gonopods of female with claw long and rather strongly bent or curved near middle; tripartite, the median division long and acute, the lateral small and also usually acute, the inner or more dorsal one considerably more distal in position than the outer one which is near the middle of length of claw. Basal spines long and stout, subequal, attenuated uniformly from base distad. Basal article with inner side nearly straight.

Body more robust than in devorans, the length being mostly less than seven times as great as width of tenth dorsal plate (6.8). Considerably attenuated cephalad from eighth plate, with the third plate narrower

than the first and the latter clearly narrower than the head. Average ratio between widths of head and first and tenth dorsal plates 68:65:74.3. A male has widths of head and first, third, eighth, tenth and twelfth dorsal plates to each other as 68, 65, 63, 75, 75, and 68.

Length from 17 to 24 mm. A female 19 mm. long has antennæ 10.5-11 mm. long, anal legs 8.5+ mm. long, and tenth dorsal plate 2.8 mm. wide. Males have similar relative measurements.

Type Locality: Fernwood, Mississippi.

Known Localities: Mississippi (Fernwood, Canton and Byram. Author, collector, 1910).

Although it has seemed impossible on the basis of any previously stated characters to maintain as distinct several species allied to *L. mordax* and *L. vorax*, through the use of characters not previously detected the writer finds it now an easy matter to discriminate between them. Such of this group of species, the larger forms dominating in the Southeast, as have the posterior angles of seventh, ninth, eleventh and thirteenth dorsal plates produced thus far known from the U. S., are, in addition to *devorans* and *voracior*, above described, the following: *mordax* K., *transmarium* K., *vorax* Meinert, *tyrannus* Bollman, *suprenans* Chamberlin, and *latzeli* Meinert. The writer's previously expressed opinion that *clarus* McNeill was based upon immature specimens has been confirmed by an examination of the types of this species, these proving to be *vorax* in the pseudomaturus stage; *mordax* and *transmarinus*, merged by Bollman in *spinipes* Say, are clearly distinct; and study of types shows *tyrannus* and *latzeli* to differ from *vorax* which previously had been thought identical, the published diagnoses revealing no truly distinctive characters.

Genus *Sozibius* gen. nov.

Type.—*Lithobius tuobukus* Chamberlin.

The following species is placed here only tentatively.

Sozibius pungonius sp. nov.

Dorsum very light brown. Head cephalad of frontal suture and the caudal segments darker, somewhat orange colored. Antennæ yellow. Venter and legs very pale, the posterior pairs bright yellow. Prosternum and ultimate ventral plates dark yellow.

Antennæ short composed of twenty-one articles of which the first six are long, the others shorter.

Ocelli about eleven, small arranged in three curved and rather irregular series; thus, 1+5, 3, 2.

Prosternal teeth 2+3.

Angles of none of the dorsal plates produced.

Coxal pores very small, 2, 3, 3, 2.

Ultimate pair of coxæ armed laterally, the ultimate and penult pairs armed dorsally.

Spines of first legs 2, 3, 2; of the penult 1, 3, 3, 2, the claw single; of the ultimate 1, 3, 2, 1, the claw single.

Anal legs of male long and slender the fourth, fifth and sixth joints longitudinally furrowed on ectal surface, laterally compressed.

Length.

Locality: Marshall, Colorado (Prof. T. D. A. Cockerell).

One male specimen.

Genus **Poabius** gen. nov.

Type.—*Poabius verdescens* Chamberlin.

Other known species belonging to this genus are *bilabiatulus* Wood, *pitophilus* Chamberlin, *sokovus* Chamberlin, *clavigerens* Chamberlin, *utahensis* Chamberlin, *yukus* sp. n., and the two new species described below.

Poabius nankus sp. nov.

Light orange brown, caudal borders of major scuta darker; head somewhat darker caudad of frontal suture. Antennæ and legs yellow. Venter yellow, the prosternum and caudal segments a little darker.

Body markedly attenuated from tenth dorsal plate cephalad. Most dorsal plates with a strong median furrow which may be doubled and, on each side, one or two approximate lateral ones diverging from it caudad; within each lateral margin a furrow or sulcus running from near anterior edge at first near to and subparallel with the lateral margin and then bending away from it caudo-mesad to end at the transverse furrow which traverses most plates a little cephalad of caudal margin.

Head subcordiform; caudal margin nearly straight; distinctly margined caudally and along cauda-lateral angles; a short transverse sulcus a little cephalad of caudal margin and between this and the frontal suture a median and several lateral pairs of longitudinal impressed lines or sulci.

Antennæ moderately short, composed of twenty more or less uniform articles.

Ocelli pale, small, fifteen or sixteen in number arranged in four straight and regular series; thus, 1+5, 4, 4, 1 (2).

Prosternal teeth dark, low, 2+2.

Angles of none of the dorsal plates produced.

Coxal pores circular, the edges weakly chitinated; 2, 3, 3, 2.

Last two pairs of coxæ laterally armed; the last three pairs dorsally armed.

Spines of the first legs 1, 3, 2; of the penult, 1, 3, 3, 2, armed with three claws; of the anal 1, 3, 2, 1, the claw single.

Gonopods of female with the claw tripertite; basal spines 2+2.

In the male the anal legs have the prefemur elevated into a rim-like structure on dorsal or dorso-mesal side at distal end, and the femur bears at the proximal end on same side an ear-shaped process which is

excavated above, the depression being continuous with a longitudinal median furrow on dorsal surface. See Pl. XII, fig. 4.

Length 13-14 mm.; width at tenth plate 1.9-2.2 mm.

Locality: Las Valles, New Mexico (Prof. T. D. A. Cockerell)

The types consist of a male and a female.

Poabius iginus sp. nov.

Light brown, scuta mostly with the caudal borders darker, reddish brown; posterior segments darker. Head chestnut, darkest behind frontal suture, a dusky or blackish median longitudinal stripe for a short distance in front of caudal margin. Legs yellowish, caudal pair from base to fourth joint inclusive reddish brown or chestnut, distally like the others. Venter brown, the ultimate plates reddish brown. Prosternum light reddish brown. Antennæ mostly dark brown, becoming pale distad.

Scuta roughened, mostly showing a median and two lateral longitudinal sulci or in some the median replaced by two diverging sulci.

Antennæ moderate, articles 20.

Ocelli distinct, ten in number, arranged in three series; thus, 1+4, 3, 2.

Prosternal teeth 2+2.

Angles of none of the dorsal plates produced.

Coxal pores small, well separated, round, 2, 3, 3 (4), 2.

Last two pairs of coxæ laterally armed.

Tarsi of anterior pairs of legs rather indistinctly biarticulate. Spines of first legs 2, 3, 2; of penult 1, 3, 3, 2, armed with three claws; of the anal 1, 3, 2, 0, the claw single.

Gonopods of female with the claw tripartite; basal spines 2+2, proximally clavate, distally conical.

Anal legs of male with the fourth joint enlarged and bearing mesodorsally and proximad of middle a conspicuous, flattened, keel-like lobe and at its distal end a small wart-like elevation.

See Pl. XIII, fig. 2.

Length 11.5 mm.; width 1.7 mm. Length of antennæ 4 mm.; of anal legs 4.2 mm.

Locality: Madison, Wash. (Dr. E. Bergroth).

Closely allied to *P. bilabiatu*s and *P. verdescens*; but manifestly smaller and differing in the lobes of anal legs and in the smaller number of spines born dorsally at distal end of third joint, etc. See Pl. XIII, figs. 1 and 2.

Family CRYPTOPIDÆ.

Genus **Kethops**, gen. nov.

Pairs of legs 23.

Seventh segment not bearing spiracles.

First dorsal plate with transverse semi-circular sulcus.

Other dorsal plates excepting the ultimate with two sharply impressed longitudinal and subparallel sulci.

Last dorsal plate margined laterally, caudal margin convexly protruding.

Sternal plates elongate, narrowed caudad the caudo lateral corners obliquely excised. (See Pl. XIII, fig. 5). Each with a distinct longitudinal median sulcus and submarginal sulci.

Pseudopleura produced caudad into an acutely pointed process; porose ventrally; armed ventrally and laterally with spines.

Legs sparsely armed with spinescent bristles which appear spine-like especially on proximal joints. A stout spine at distal end of tibia dorsal in position and a second one ventral. Tarsi, excepting the ultimate, one-jointed, a stout ventral spine distad of middle.

Prefemur of anal legs armed with rows of spines on mesal and ectal surface and on most of the ventral. Femur similarly armed mesally and ventrally. The tibia with similar spines ventrally. Tarsus composed of but two joints and ending in a distinct and very stout claw.

Type: *Kethops utahensis* Chamberlin.

The type species was originally described from Utah under the genus *Newportia*, the absence of anal legs from the type specimen leading to the reference to this genus. While close to *Newportia*, it has various *Cryptops*-like characters and is readily separated by the character of the anal legs, etc. A short time ago among some old material from New Mexico sent me by Prof. Cockerell, a perfect specimen of the form was found, making possible the diagnosis given above. A description of this specimen follows:

***Kethops utahensis* Chamberlin.**

Ferruginous, uniform; antennæ and legs, excepting the ultimate pair, paler, yellowish; anal legs colored like the body, but pale distad.

Head coarsely punctate, two diverging longitudinal sulci on the caudal portion which begin at a transverse sulcus in front of and parallel the caudal margin.

Antennæ composed of seventeen articles.

First dorsal plate with semi-circular impression deep, somewhat angularly bent caudad at middle, mesal portion in a broad depression or pit on the caudal slope of which there is a distinct W-shaped mark like that found in many species of *Newportia*, the two usual longitudinal sulci over caudal portion of plate.

Sulci of second plate strongly diverging caudad, those of the succeeding plates nearly parallel.

Last dorsal plate without distinct sulci; caudal margin convexly bowed out; lateral margins armed with two rows of spinules. (See Pl. XIII, fig. 3).

Anterior margin of prosternum straight or nearly so, but slightly indented mesally. Prosternum punctate, two sulci, which, approximate below, diverge distad toward the free margin.

Ventral plates irregularly punctate, more densely so on caudal portion. Median sulcus beginning a little caudad of anterior margin and extending over anterior two-thirds or somewhat more of length of plate; a submarginal sulcus on each side which is deepest mesally; usually two or more weaker and more indefinite transverse sulci as shown in the figure. (See Pl. XIII, fig. 5).

Last ventral plate narrowed caudad; rounded caudally; bearing spinules over entire surface.

Last pleuræ furrowed laterally; with numerous small pores on ventral surface, both the free portion and that covered by ventral plate. Caudal process bearing acute spine distad. Pleuræ with many spines laterally and ventrally. (See Pl. XIII, fig. 4).

Prefemur of anal legs longitudinally furrowed both ventrally and dorsally; armed with numerous spines arranged in obliquely longitudinal rows which cover entire surface excepting dorsal portion and the furrow on the ventral. Femur also longitudinal furrowed dorsally and ventrally, the mesal side of ventral furrow formed by a keel-like elevation which does not quite reach distal end. Spines on edge of keel and elsewhere on ventral surface as shown in figure. Tibia with a mesally bent longitudinal keel, the bent mesal portion lower than end parts, this keel limiting a broad groove mesally, into which groove the tarsi of the specimen are bent or flexed like the blade of a knife. First joint of tarsus with at least one ventral spine; claw long and stout.

Length about 20 mm.

Locality: Glorieta, New Mexico (Prof. T. D. A. Cockerell).

The original type was collected by the author at the Warm Springs north of Salt Lake City in 1908.

Family SCOLOPENDRIDÆ.

Genus *Scolopendra* Linn.

Scolopendra mohavea sp. nov.

Very pale olive brown; the caudal half of body darker brown, dusky, or in one specimen largely solid black, with a pale longitudinal median line, Head paler cephalad of frontal suture.

Head with a transverse sulcus a little ways in front of the caudal margin, and between this sulcus and the caudal margin two straight, short, longitudinal sulci which are parallel. Cephalad of transverse caudal sulcus a pair of furrows which converge forward and end caudad of frontal suture, each furrow doubly curved, at caudal portion with concavity ectad, anteriorly convex ectad, the very anterior end bent abruptly mesad; ectad of each one of these furrows a second less sharply impressed furrow which also converges toward the mesal line cephalad; between the two sulci on each side a short sulcus runs obliquely cephalo-ectad. Smooth.

Antennæ long; composed of twenty-six articles of which the first six or seven are comparatively smooth, the scattered hairs upon them increasing on number from the first article distad.

First dorsal plate with sharply impressed cervical furrow. On each side a furrow which caudad is parallel with caudal margin, from there curving obliquely cephalo-ectad. A median longitudinal sulcus cephalad of cervical groove. Smooth.

Second dorsal plate with median longitudinal sulcus on anterior half. The two usual paired sulci crossing the entire plate and diverging caudad. On each caudo-lateral portion of plate a furrow curving obliquely cephalo-ectad as on first plate, similarly taking its origin near caudal margin.

Third and fourth dorsal scuta with median furrow. The paired longitudinal sulci less strongly diverging caudad than on preceding plate. Furrow on each caudo-lateral portion as in the preceding scuta.

On the fifth and subsequent dorsal plates the paired sulci become nearly parallel, but diverging some at the ends. Median furrow evident, but not so the caudo-lateral ones. On each side a longitudinal furrow subparallel with the lateral margin, this furrow often broken. On a few of the more caudal segments a transverse sulcus on each side parallel with and close to the anterior margin. The twentieth plate laterally margined for its entire length; the nineteenth all but a short distance caudad; the eighteenth not margined for a somewhat greater distance caudad and a short distance cephalad; the margination of the seventeenth and sixteenth plates similar to eighteenth but extending less caudad and cephalad reaching the transverse sulcus; other plates not margined.

Lost dorsal plate with caudal margin mesally strongly and evenly convexly extended. A sharply impressed longitudinal median sulcus which does not quite reach the caudal margin. A short furrow parallel to the median one opposite its middle portion on each side.

Prosternum smooth; a median sulcus evident only for a short distance distad; transverse sulcus obscure; two weak longitudinal furrows, which, close to the mesal line caudad, diverge and are more distinct cephalad. Each dental plate with four teeth, of which the three inner ones are basally fused, the two most mesal being free only at their distal points; a deep narrow incision between the plates; the transverse furrow at base of each plate distinct, the two meeting mesally at an obtuse angle.

Basal tooth of prehensorial feet long, subacute, presenting but one point.

Penult article of palpus of second maxilla with a slender spine at distal end.

Ventral plates from the second to the twentieth inclusive with two sharply impressed longitudinal sulci which cross the entire plate.

Last ventral plate narrowed caudad, the sides weakly excurved-caudo-lateral corners rounded; caudal margin a little incurved mesally. Smooth. Depressed along the median line. A weak furrow subparallel with and not far from each lateral margin.

Prefemora and femora of legs of the first to penult pair inclusive without any dorsal spines at distal end; all with a tarsal spine, those of the first pair with two.

Pseudopleura ending in a stout process which terminates in two points or spines and bears proximad on its ectal surface a row of three stout teeth or spines.

Prefemur of anal legs ventrally with seventeen spines arranged in three longitudinal rows, of which the innermost is proximally irregular; these from ectal row mesad arranged thus, 4, 6, 7. Mesal surface with ten spines. Distal process with five spines. Femur unspined. Claw of tarsus with two basal spines.

Length 40-45 mm.

Locality: Fort Mohave, Arizona (March 7 and 18, 1911).

Three specimens received from Prof. Junius Henderson of the University of Colorado Museum.

Family SONIPHILIDÆ.

Genus *Soniphilus* Chamberlin.

Soniphilus geronimo sp. nov.

Yellowish brown anteriorly, becoming clearer yellow caudad. Head darker caudad of frontal suture. Antennæ light brown, paler distad. Legs yellow, those of anterior segments darker. Prosternum and prehensorial feet light reddish.

Antennæ of moderate length; articles moderate, not much differing in length, the ultimate about equal in length to the two preceding taken together.

Cephalic plate longer than wide in about ratio 7:6; narrowed cephalad; lateral and anterior margins convex, the latter a little emarginate mesally; middle portion of caudal margin sub-straight, rounded laterally. A short impressed median line back frontal region; on each side a little mesad from and parallel with margin a longitudinal furrow; on lateral portion of plate on each side a pair of sulci diverging cephalad and a second less distinct pair more mesal in position. Frontal plate not discrete. (See Pl. XII, fig. 4.)

Labrum with median piece comparatively large, bearing about six stout teeth.

Prebasal plate not exposed. Basal plate short, its greatest width more than 4.5 times the median length, a greater length exposed on each side. (See Pl. XII, fig. 4).

Claws of prehensorial feet when closed not reaching anterior margin of head by a considerable distance. None of the joints bearing teeth or nodules. (See Pl. XII, fig. 2).

Dorsal scuta with lateral sulci distinct; a second pair of sulci close to median line and on most also an intermediate sulcus on each side.

Anterior prescuta very short, increasing in length to about beginning of caudal third, then again more rapidly decreasing and becoming again short.

Anterior spiracle moderately large, circular or subcircular, being slightly vertically elongate; succeeding spiracles all circular, very gradually decreasing in size to the caudal ones which are very small.

First pair of legs much shorter and more slender than the second.

Ultimate legs long, the penult and antepenult joints furrowed longitudinally on ventral surface. Claw long and stout.

Sterna with a distinct median longitudinal sulcus or furrow which is crossed at middle by a transverse furrow. Pores not detected.

Last ventral plate very wide, strongly narrowed caudad. Caudal margin straight or a little incurved. (See Pl. XII, fig. 3).

Anal pleuræ bearing a number of small pores which are all wholly covered by the last ventral plate.

Anal pores not detected.

Pairs of legs 73.

Length 34 mm.; width 1 mm.

Locality: San Geronimo, New Mexico, (Mrs. W. P. Cockerell and Miss Mary Cooper, coll.).

CLASS DIPLOPODA.

Family NANNOLENIDÆ.

Genus *Buwatia* gen. nov.

Ocelli none.

Antennæ clavate, the fifth and sixth articles thickest; third and fifth longest, nearly equal in length, the second and fourth next.

Body decidedly narrowed caudad of head to sixth segment.

Body iulus-like in form. Segments without carinæ, nearly smooth, not clothed with hair. All segments striate beneath; a deep sulcus across segment at level of pore.

Claws of legs long and slender.

Type: *Buwatia monterea* sp. nov.

As but one specimen of the type species has been secured, dissection for fuller structural details has not as yet been attempted. The genus may be distinguished from *Nannolene* through the absence of ocelli.

Buwatia monterea sp. nov.

Dorsum brown; head and anterior part of first segment whitish brown; first and ultimate segments light brown; a series of small, largely obscure dark spots along each side, one at each pore. Legs and antennæ pale.

Body slender, nearly uniform in width for most of length but decidedly constricted from head and first segment to region of sixth segment.

Head nearly smooth, weakly and very finely punctate; glabrous except for a few bristles on clypeal and labral region. A weak median longitudinal sulcus across vertex. A furrow or excavation from base of each antenna caudad to lower margin of first dorsal plate, the antenna bent back and lying in this furrow.

Antennæ rather short, strongly clavate; the seventh article short, its four sensory cones almost concealed in the terminal pit; clothing of hair becoming more and more dense distad, sparse proximad.

First dorsal plate large, closely embracing caudal portion of head. Anterior and posterior lateral angles rounded, the lateral margin between them extending obliquely caud-oventrally, rather, long, somewhat incurved. Anterior margin incurved at middle curving out convexly on each side and then again at sides incurved bow-shaped. A fine transverse sulcus subparallel to the anterior margin and some distance from it and a second one submedian in position.

Subsequent segments with a longitudinal furrow at level of pore, this more distinct on cephalic portion of segment. A transverse sulcus in front of median suture. Prozonites striate throughout, the main segment strongly striate beneath and on sides below level of pores. Dorsum a little depressed; a weak longitudinal depression each side of middle, leaving mesal portion a little elevated.

Anal scutum considerably exceeded by the anal valves; caudal division short, widely and evenly rounded, set off or limited from major portion in front by a transverse sulcus. Caudal margin with two pairs of long setae.

Anal valves elongate, their free margins elevated. Each valve bears near its mesal margin a long seta at caudal and second one near middle of length in a furrow or sulcus which curves from mesal margin first laterad and then latero-cephalad.

Anal scale very short; caudally weakly convex, anteriorly strongly so; antero-lateral angles rounded, but not so the caudo-lateral ones.

Legs moderately long and slender; claws long, not robust.

Segments of body forty-five.

Length 11-12 mm.; width as .5-.5 mm.

Locality: Pacific Grove, Cal. (April, 1911, author.)

One specimen secured under a stone in an open field near the Hopkins Laboratory.

Family CAMBALIDÆ.

Genus *Titsona* gen. nov.

Eyes well developed, each consisting of a number of ocelli arranged in a single series parallel with anterior margin of the first dorsal plate.

Antennae short, very slender proximad but strongly enlarged distad, clavate; the fifth and sixth articles conspicuously and abruptly thicker than others. The third, fifth and sixth articles longest, not much differing in length from each other; second and fourth articles subequal.

Gnathochilarium nearly as in *Paiteya*. Promentum triangular, completely separating the laminae linguales which are attenuated proximad to an acute angle. Mentum large, widening proximad.

Body strongly constricted from head and first segment to region of fifth and sixth segments, from where it again increases in width caudad.

First dorsal plate very large, extending over caudal portion of head from which the lateral portions extend free.

All segments striate beneath. Each segment from the fifth to the antepenult inclusive with four carinae, a dorsal carina each side of median line and one farther laterad on each side, the latter bearing the pore.

Legs sparsely armed with spinescent bristles. First pair in male reduced, composed of six articles normally armed.

Type: *Titsona sima* sp. nov.

Evidently close to *Paiteya*, the type of which is likewise a Californian species.

Titsona sima sp. nov.

General color caudad of fifth segment dark brown, the caudal portion of each segment light brown. First dorsal plate light brown, a dark stripe parallel with but a little removed from the caudal and the cephalic border, the two stripes confluent at the sides of plate. Second to fourth segments light brown, each with a narrow transverse stripe of dark brown and especially laterally with a network of lines of same color, the proportion of dark larger the more caudal the segment. Head light brown, darker adjacent to first dorsal plate; on clypeus a square with upper side missing outlined in dark brown and immediately above this a subelliptical outline in same color with dorsal and ventral ends acutely angular. A pair of somewhat confluent brown spots in line from the brown about each eye ventro-mesad toward lower part of elliptical outline of front. Legs very pale.

Ocelli in a single row, 5-7 in number, black, uniform; the series parallel with margin of first dorsal plate which partly covers it on caudal side.

Antennae short, strongly clavate; the fifth and sixth joints much stouter than the others, the fifth strongly enlarged from its base distad, the sixth more uniform and broadest proximad. Hairs more dense distad as usual. (See Pl. X, fig. 5).

Stipites of gnathochilarium inclusive of processes nearly four times as long as greatest width. Mentum abruptly narrowed at distal end, wider at base than the median length approximately in ratio of seven to six. A semi-circular impression on proximal portion deeply impressed, the concavity directed distad. Promentum narrowly triangular. Laminae linguales narrowed to an acute angle proximally, about three times as long as greatest width.

First dorsal plate very large, embracing caudal portion of head mesally, its lateral wings separated from sides of head by a space into which the antennae may be bent back. Anterior margin widely weakly concave, laterally running obliquely caudo-ventrad. Caudal margin nearly evenly convexly rounded mesally, lateral portion of plate bent ventrad and somewhat caudad and then mesad beneath. Caudal portion of plate more constricted than the anterior. On each side above lateral angle are several striae extending from caudal margin cephalad.

Next three segments striate beneath. Fifth and subsequent segments with prozonites striate throughout, the main division of segment striate beneath and dorsad only about half way to pore-bearing swelling

or carina. Each segment from the fourth to the antepenult with four carinae, one far dorsad on each side consisting of a hemispherical swelling chiefly on portion cephalad of suture and bearing the pore, the other close to the mesal line and also more thickened cephalad than caudad, low, rounded. All segments constricted dorsad and cephalad from the transverse suture. (See Pl. X, fig. 6).

Anal scutum long, widely rounded caudally; a rather weak median longitudinal sulcus on anterior portion; a bristle borne each side of mesal line near middle of length, and a second pair borne on caudal margin.

Anal valves long, about equalling the anal scutum; smooth; margins elevated; bearing two pairs of bristles close to mesal margin, one pair caudal and the other submedian in position.

Anal scale short and broad, transversely narrowly elliptical. A pair of bristles borne on caudal margin, one each side of mesal line.

Legs rather sparsely provided with short spiniscent bristles.

First legs of male reduced, six jointed.

Gonopods of male reduced and nearly wholly concealed.

Segments ad forty-two.

Length about 16 mm.; greatest width 1 mm.

Locality: Oroville, Cal. (April, 1911; author coll.).

Two specimens were secured.

Family NEMASOMIDÆ.

Genus **Nemasoma**.

Nemasoma uta, sp. nov.

Dorsum dark brown, the color nearly solid in band on caudal portion of each segment and in some in a narrower stripe adjacent to anterior margin, the color over remaining portion of segment mostly in a network or areolation over a light background, the light spots often confluent dorsally into transverse band. Sides light brown, the light area extending farthest dorsad at middle of segment, the light area of sides limited on all sides by border of dark brown. Each segment with whitish spot on median dorsal line. Vertex of head areolated with lines of dark brown over a light background, the frons between bases of antennae and the eyes dark brown, the area enclosing a pair of lighter spots each side of the median line and ventrad of these a second pair of spots between bases of antennae at lower portion of the area. Clypeal region paler from presence of numerous lighter spots, ventrad and laterally yellow, as is also the lateral portion of head. Stipes of mandibles laterally covered with network of dark brown lines over light background. Eyes deep black. Antennae brown, each segment whitish proximally and the second article almost wholly so. Legs brown, more or less broken with whitish, paler proximally. Ventral surface light brown. Anal scutum very dark, the anterior portion with numerous light dots. Anal valves pale along mesal border, elsewhere brown.

Body very slender, attenuated cephalad, narrowest immediately caudad of head.

Head smooth, free from hairs except for the usual bristles along labrum. A transverse sulcus between eyes, each side portion bending caudad to meet other at an obtuse angle on mesal line, to which angle the median longitudinal sulcus across vertex extends.

Antennæ longer than width of body; strongly clavate; sensory cones long. Subdensely hirsute distally, more sparsely proximad.

Eyes large, oblong, its upper and lower margins nearly parallel, the mesal convex and the ectal oblique. Ocelli arranged in five series; thus, 3, 4, 4, 4, 2, giving a total of 17.

First dorsal plate narrower than the head inclusive of mandibles, shorter than the two succeeding plates taken together. Middle portion of anterior margin evenly convex, laterally extending obliquely caudo-ventrad and somewhat concave. Caudal margin mesally straight, on sides convexly bending cephalad and meeting anterior margin at an angle. Dorsal of each lateral angles the plate is obliquely depressed or shallowly furrowed.

Subsequent segments smooth above; striate ventrad of level of pores, the lower or ventral striae deep.

Anal scutum in outline as viewed from above with lateral margins parallel or a little diverging caudad, nearly straight or slightly convex; caudal margin widely rounded, bearing beneath a seta on each side. About equalling the anal valves or a little exceeded by the latter.

Anal valves strongly bulging from base to free mesal edge, the surface of each valve extending very obliquely ventrad. A long bristle borne near mesal edge of each valve near middle of length.

Anal scale with anterior and cadual margins each strongly convex, the two meeting on each side in an acute angle. A pair of bristles springing from mesal portion.

Number of segments 44.

Length 12.5 mm.; greatest width ad .75 mm.

Locality: Little Willow Canyon, Salt Lake County, Utah, (1905; author, coll.).

But one specimen thus far found.

Family PARAIULIDÆ.

Genus **Paraiulus**.

Paraiulus tivius sp. nov.

Head light brown, a broad transverse band between eyes and ventrad of their level deep brown, the band enclosing above two pairs of light dots, and between antennæ a pair of large obliquely placed, oval light spots, a bristle inserted in each of most dorsal pair of light spots; vertex above the dark band with network of dark lines, a similar network covering the stipes of mandibles laterally, each of the latter with dark transverse stripe across dorsal part. Ventral surface and lower part of sides of body light brown. On each side a series of black dots extending from sixth segment to about the antepenult. Anterior and caudal margins pale, adjacent to the pale marginal stripe in each case a dark transverse band which is much widest mesally; remaining part of plate

broken into network or areolation by light spots which may be confluent into one or more cross stripes. Other segments with the caudal transverse stripe, this becoming broader on more caudal segments and extending on each side to the lateral dark spot, below which it is continued as a more obscure band formed by network of dark lines, the dark band transversely divided by a series of light spots. Prozonites light brown. Anal scutum uniform dark brown, with anterior border pale. Legs light brown or yellowish. Antennae with proximal portion of each segment yellowish, the distal darker brown, especially in ultimate articles.

A broad transverse depression extending between eyes, in its mesal portion or adjacent to same lying the setigerous light spots above mentioned. A median longitudinal sulcus crossing vertex and ending in the transverse furrow. Head nearly free from ordinary type hairs excepting the two setae mentioned and the bristles on clypeus and labrum. On lateral portions of clypeus and on the stipes of mandibles is a number of peculiar, probably sensory, hairs, each of which is subclavate in form with a narrow apical process and a slender basal stalk inserted in a corresponding pit, near the upper portion of which it presents a globose enlargement. (See Pl. XI, fig. 7). The tegument about the basal stalk dark.

Eyes triangular, an angle directed toward base of antennae, upper side straight, outer side convex above and concave below, mesal side concave above and convex below. Ocelli about 45 in 7 or 8 series; counting from above ventral, 8, 10, 8, 7, 5, 4, 2, 1.

Antennae rather short, conspicuously clavate.

First dorsal plate with lateral borders rounded anteriorly, not produced, angular posteriorly; margined anteriorly and laterally, the elevated anterior margin widest mesally, not margined caudally. One or two rather weak striae on each side below extending from caudal margin cephalad part way across plate.

Pores moderate, widely separated from the transverse suture which is straight or at most weakly sinuate at their level.

Anal scutum with caudal portion subtriangular as usual, the apical process bluntly rounded and not at all decurved; plate crossed by a series of transverse furrows or sulci of which the more caudal ones are deepest; caudal triangular portion of plate with a series of setae along each lateral margin, three similar long setae springing from caudal process. Lower portion of segment bearing a long seta near middle height of caudal margin and a second in line with legs of more anterior segments.

Anal valves nearly smooth, the mesal margins strongly elevated as usual; two setae on each valve just ectad of elevated mesal margin, one submedian and the second between this and the caudal end.

Anal scale with anterior margin convex, the posterior portion subtriangular its sides convex. A long seta borne on margin each side of mesal line. A dark line paralleling margin but indented mesally gives superficial appearance of caudal emargination to scale.

The gnathochilarium of the male has the promentum very large, broadly elliptical in outline. For form and relations of stipes and other parts see Pl. XI, fig. 6.

First legs of male strongly enlarged, uncinatè, as usual; caudal surface glabrous excepting distal article, the anterior surface with long stout hairs. (See Pl. XI, fig. 5).

Second legs as usual greatly reduced excepting for the strongly enlarged coxæ; the latter produced mesally into a long, tongue-like process which extends cephalo-ventrad between the first legs. (See Pl. XI, fig. 4).

Gonopods large and conspicuously exposed, bent above base strongly ventro-cephalad. Inner branch of anterior pair much longer than the outer, contiguous with each other mesally, clavately enlarged distad; outer branches broad, plate-like, densely clothed with long setæ along anterior-ventral and distal borders. Anterior pair apically terminating in two spines, the more anterior of which is a little curved distad and at end is expanded; the other process strongly curved ventro-ectad, crossing the first, and terminating acutely. (See Pl. XI, figs. 1 and 2).

Length ad 20 mm.; width 1.6 mm. (female). Male more slender, length 16-18 mm.; width 1.2 mm.

Locality: Mill Valley, Cal. (April 8, 1911; author, coll.).

About a dozen specimens were secured.

Paraiulus timpus sp. nov.

Dorsum with a broad band of light brown, paler than the sides. A median dorsal line of black which expands into a wider dot on anterior portion of each segment. Each segment bordered caudally with a narrow blackish stripe; a broader and more diffuse transverse dark band farther cephalad on segment, this band embracing a transverse row of four light spots of which the two inner ones are smallest, oblong and obliquely placed, sometimes confluent cephalad with anterior pale portion of segment, the two outer light spots confluent caudad with the pale area between the two dark bands. On the anterior segments the light and dark areas of dorsum merged and the whole covered with a close network or areolation of dark lines over light ground and the median dorsal line as such less distinct. First dorsal plate entirely covered with similar network, the lower portion of sides dark brown or smoky; a narrow dark transverse stripe caudad of anterior margin. Sides of segments dusky or blackish, darkest along caudal margin, in a stripe continuous with the dark dorsal one, prozonites paler; a large light spot below level of pore on each segment, this spot mostly more or less constricted into two or three parts. Venter pale, a large light spot ectad of legs on each segment. Vertex of head with a dense network of black enclosing rows of very small, longitudinally oval light dots; frons between eyes solid black, enclosing a pair of light dots close to mesal line; brown between antennæ the area enclosing a number of paler dots. Clypeal and labral region yellowish. Antennæ deep purplish brown. Legs very pale, distal joints streaked with purplish or purplish brown.

Head finely roughened or rugose; free from hairs excepting the usual ones in clypeal and labral region and a single long median bristle at anterior end of the distinct median sulcus of vertex. A deep furrow extends from mesal angle of each eye to that of the other, the furrow angularly bent caudad mesally, the longitudinal median sulcus of vertex meeting this angle; farther forward a second transverse furrow, in front of which the head appears to bulge in a low transverse ridge.

Eyes large, triangular, its sides a little convex, one angle mesal and another immediately above base of antennæ. Ocelli about 39, arranged in seven transverse and gently curving series; thus, 8, 8, 7, 6, 5, 3, 2.

Antennæ moderate; proximal joints slender; distad thickened, clavate, as usual.

First dorsal plate large; mesal length about equalling that of two succeeding segments together. Anterior margin evenly convex; cephalo-lateral corners strongly rounded, the caudo-lateral more angular. Margined laterally and at sides cephalically, but not so the median portion; caudal border not margined. Not striate on sides below. A fine median longitudinal impressed line extending from caudal margin cephalad about three-fourths of the length of plate, at its anterior end breaking into two lines which diverge cephalad and become indistinct.

All subsequent segments striate beneath and over lower portion of sides, the striæ deep.

Anal scutum rounded caudad, mesally weakly indentate, a slight tooth each side of indentation; smooth.

Anal valves smooth, the mesal margin but weakly and narrowly elevate.

Anal scale with caudal margin convex, the cephalic more strongly so, the two meeting at an angle on each side. A pair of caudally projecting bristles inserted a little in front of caudal edge.

Mandibular stipes considerably produced below, mesally excavated.

Gnathochilarium with the enlarged promentum narrowly elliptical or rather wider distad than proximad as shown in figure; relatively narrower than in most species. (See Pl. XI, fig. 8).

First legs of male strongly enlarged and uncinate in the usual way; mesal surface complanate and strongly tuberculate, the tubercles in distinct cross series. Caudal surface glabrous, long hairs on the anterior.

Second legs with the greatly enlarged coxæ fitting closely against bases of first legs and bent cephalad between the latter; other joints greatly reduced the ultimate densely clothed with short stiff hairs, those at apex longer.

Gonopods of male large and conspicuously exposed. Anterior pair with two main branches, the outer of which is flattened ect-mesally, of nearly uniform width, distally rounded, clothed with long bristles on mesal side; the inner branch also flattened or plate-like, bent cephalad and, as seen from ventro-caudal aspect, appearing expanded at free end into a foot-like shape with the toe mesal and the heel ectal in position. Each of the posterior gonopods enclosed or embraced at base on ectal side with a low plate the extended ends of which bend about it in front

and behind; an inner process which is a narrow thin plate for most of its length, terminating apically in a slender spine which curves cephalad in a sort of hook; outer division consisting of a long slender style or spine which is bent apically and ends acutely, this lying against a twisted plate-like division which at its end is sharply bent about the styliform division some distance below the end of the latter. (See Pl. XI, fig. 9).

Number of segments 46.

Length about 18 mm.; width 1.8 mm. (male).

Locality: Las Valles, New Mexico, (Prof. T. D. A. Cockrell, coll.).

A male and female are in the collection, the description above being that of the male.

***Paraiulus garius* sp. nov.**

Head with brown band bordering labial and clypeal margins, the lower mesal portion of the clypeus being pale, its upper portion of same color as the border but not solid, the dark color a mottling or network over a paler background; a black transverse band between the two black eyes, this band concavely excised on front each side of middle and enclosing a pair of small light spots near median line; vertex of head covered with close network of black or deep brown color over a lighter background, a similar or somewhat paler network covering the stipes of mandibles laterally. Antennæ dark purplish brown or blackish. Body dark or dusky brown the lower portions of sides and the venter paler; a continuous dark median longitudinal line along dorsum and a row of black dots along each side beginning at about sixth segment; a darker ring of more solid color about anterior portion of each segment; a sub-circular patch of closely placed light dots on lower portion of each segment, and between this patch and the black dot an elongate patch similarly formed, while dorsad of the black spot is a third area and between the latter and the mid-dorsal line and elongate narrow band or line of such light dots; caudad of the latter line and parallel with it is a light line or narrow band partly encircling the segment but fading out ventrad on each side, this light line being continuous, not broken into dots. First segment dark along both anterior and posterior borders. Anal scutum dark brown, the venter-caudal margins pale. Anal vales with cephalic portions dark brown, the meso-caudal portions light. Legs proximally clear yellow or light brown, the distal articles covered with network of dark purplish brown.

A deep transverse furrow between mesal angles of eyes, to which the median longitudinal sulcus across vertex extends. A row of setæ along labral margin as usual and also a second row of about nine short setæ across lower portion of clypeus, the latter row being inversely V-shaped with the angle very obtuse.

Antennæ of moderate length, slender, not strongly clavate.

Lateral borders of first dorsal plate not produced; venter-caudal angle in outline sub-rectangular, the vertex rounded, the margin from here running obliquely cephalo-dorsad; anterior margin widely rounded,

the caudal nearly straight, both margined, more strongly so ventrad over lateral portions. Two deep longitudinal striæ across plate dorsad of lateral margin on each side.

Segments deeply striate beneath and on lower sides, the striæ on some anterior segments extending dorsad nearly to the black spot.

Repugnatorial pores moderate, well separated from the transverse suture which at this level is very weakly curved, remaining almost straight.

Anal scutum with apical process straight, acute, not at all decurved, somewhat exceeding the anal valves; bearing four setæ along each caudo-lateral margin. (See Pl. XII, figs. 6 and 7).

Anal valves with mesal margins elevated, the elevated ridge crossed by a series of transverse sulci; each valve widely depressed caudad of and not quite parallel with the margins of anal scale. Each valve bearing two setæ ectad of elevated mesal border, one at about one-third the distance from each end. (See Pl. XII, fig. 6).

Anal scale with caudal margin subsemi-circular, the lateral angles a little extended; anterior margin widely convex. A little cephalad of caudal margin two pairs of setæ borne on tubercles. (See Pl. XII, fig. 5).

Appendages of the second segment in female consisting of a plate presenting on each side a caudo-ventrally directed lobe which in lateral aspect appears clavate and is densely covered with bristles. Springing from the anterior portion of segment between the folds of plate is a pair of very small leg-like appendages distinctly jointed and terminating in a straight transparent claw; these appendages strongly suggestive of homology with the anterior pair of ordinarily ambulatory appendages of other segments. (See Pl. XII, fig. 8, a drawing from lateral and somewhat anterior direction of a specimen in which the first segment has been partly separated from the second the better to expose the parts; a leg of first segment is shown at left.)

Segments 52.

Length ad 31 mm.; width 2.2 mm. (female).

Locality: Tolland, Col. (Elevation, 8,000 ft.). Two female specimens collected by Prof. Cockerell in Aug., 1911.

Family POLYDESMIDÆ.

Genus *Polydesmus*

Polydesmus bonikus sp. nov.

Dorsum appearing dark brown from a close network of dark reddish brown lines over a ground of light brown; prozonites light brown; a black median dorsal line which is most distinct posteriorly. Head mostly light brown, mandibles and lateral portions palest, median portion covered with areolation of dark brown lines, a dark reddish brown band across region dorsad of level of antennæ, and extending ventral in tongue-like form between the latter. Antennæ light. Venter yellowish, with some parts tinged with pink. Legs yellow, commonly tinged with pinkish distad.

Body with sides almost parallel for most of length, attenuated anteriorly and the last few segments also attenuated in the usual way.

Vertex crossed by a deeply impressed sulcus which ends abruptly in a very short transverse line above dorsal margin of the dark transverse band. Head clothed with intermixed long and short setose hairs which are densest over frontal and clypeal region.

First dorsal plate a little wider than head inclusive of mandibles. Anterior margin weakly convex, meeting the lateral margin on each side at an obtusely rounded angle, the anterior and lateral margins together roughly hemispherical; anterior and lateral borders transparent, distinctly margined. Each lateral margin obtusely incised at a point about one-third the distance from the caudo-lateral angle to the antero-lateral, but no teeth present. Caudal margin concave mesally and convex at each side, bow-shaped. Depressed longitudinally each side of median portion which appears elevated, more especially so caudad.

Second dorsal plate with lateral portions moderately bent cephalad touching or a little overlapped by the first plate. An acute tooth at antero-lateral angle; a little caudad of this a lower, very obtuse denticulation and half way between this and the caudal angle a third very weak or obscure denticulation. A broad longitudinal depression or furrow on each side somewhat less than half the distance from middle to lateral margin of plate. Tubercular areas very weakly developed, plate being nearly smooth.

Third plate very similar to the second but the lateral margins a little shorter. Caudo-lateral corner sub-rectangular, a little obtuse. Lateral teeth as on the second.

Fourth plate with lateral margin much longer than that of second and third plates. First and second denticulations smaller; antero-lateral angle well rounded.

Subsequent dorsal plates similar to the fourth. All with the lateral longitudinal depression as described for the second. Transverse sulcus weak. Distinctly margined caudally and laterally and along free portion anteriorly. The lateral denticulations very small; a fourth weak denticle appearing on some plates caudad of the third. Caudo-lateral angles becoming in posterior segments moderately produced caudad.

Anal scutum with process obtusely rounded and bearing long setae. Dorsally with conical setigerous tubercles.

Anal valves broad, rounded laterally and caudally. Margined mesally and also caudally and laterally, the lateral margin wide.

Anal scale roughly triangular, the anterior margin convex, the caudo-lateral sides very weakly convex, meeting at middle line in an acute angle.

Ventral plates with longitudinal and transverse sulci well developed.

Legs of moderate length; bristles densest distad; ultimate joint densely and subseriately setose ventrally.

First and second legs in male strongly reduced, the second pair a little larger than the first.

For structure of gonopods of male see Pl. X, fig. 3.

Length 19-20 mm.; width 2.2 mm.

Locality: Madison, Washington. (Dr. E. Bergroth).

Family XYSTODESMIDÆ.

Genus *Xystocheir* Cook.*Xystocheir taibona* sp. nov.

Tegument thin, translucent, horn-brown in color, the carinal margins pale brick-red; prozonites paler; pigment about dorsal vessel commonly showing through as a dark median line. Head very light or whitish shining brown, a triangular dark spot below each antenna formed of closely arranged small dots. Antennæ light yellow or whitish. Legs pale yellow or yellowish brown, darker proximally. Venter and sides pale brown to yellowish.

A sharply impressed median sulcus crossing vertex and ending abruptly at about level of upper margins of antennal sockets or but little lower, crossing near its distal end a shallow furrow which arches across from the dorsal edge of one antennal socket to the other. Vertex smooth and shining. A few scattered bristles over frontal and clypeal region.

Antennæ rather long, uniform; clothed with rather short hairs intermixed with long bristles, especially on proximal segments.

First dorsal plate a little wider than the head, shorter than the second. Cephalic and lateral margins together semi-circular. Caudal margin mesally straight or very slightly incurved, laterally extending obliquely cephalad. Entire border margined. Two pairs of impressed lines, the two on each side diverging from near the mesal line caudo-laterad, the anterior one nearly straight, the posterior curved, its convexity caudo-mesad.

Second plate and those immediately following with lateral portions bent cephalad, farther back the plates becoming first straight and then with the lateral portions bent more and more caudad. In the anterior plates the cephalo-lateral portion bulges cephalad, but in proceeding caudad the anterior margin first becomes straight and then the antero-lateral corners more and more strongly rounded caudad, the posterior corners becoming at the same time more and more strongly produced. All scuta distinctly margined. Each segment crossed by two transverse sulci of which the more caudal is deepest and longer.

Nineteenth segment very short, the lateral processes ordinarily exceeded by those of the eighteenth segment.

Anal scutum with process a little depressed, truncate distally where it bears several groups long bristles, crossed with two rugose lines a double one at posterior third and the other midway between this and the apex of process, each line bearing two pairs of double setæ, two being inserted together in each case. In addition there is a marginal couple on each side of scutum farther cephalad.

Anal valves roughened; inner margins strongly elevated; each valve with two sulci extending from anterior margin caudad and somewhat laterad, the more mesal one with a double bristle inserted near its middle and each valve also bearing at its caudo-mesal angle a compact bunch of similar long setæ.

Anal scale with anterior margin incurved mesally and convex laterally, bow-shaped; each caudo-lateral margin convex, meeting its fellow of opposite side in a rounded obtuse angle. Scale crossed with a sulcus ending in the cephalo lateral corners and bending caudad across the plate; a weaker sulcus sub-parallel with this further cephalad; caudad of the first or principal sulcus and extending to caudad margin there is on each side of middle a longitudinal sulcus. Just ectad of the longitudinal sulcus on each side and nearly upon the caudal margin is a double bristle.

In the gonopods of the male the two rami on each side are fused excepting distally, the ventral one not separate and opposed to the other like a thumb as is the case in *F. dissecta* Wood. The principal or ventral ramus long and cylindrical, terminating in three spines which are inserted at the same level. Spines simply curved, not twisted; the ventral one flat, narrow, apically rounded; the outer one distally bent ecto-caudad, pointed; the dorsal one most slender. (See Pl. X, figs. 1 and 2).

Length ad 28 mm.; width 5 mm.

Locality: Region of Monterey Bay, Cal. (Pacific Grove, etc.)

A very common species in this locality (Author coll., 1902, 1909, 1911).

Related to *X. dissecta* (Wood) but the gonopods very distinct. *Xystocheir obtusa* Cook and *Fontaria furcifer* Karsch are doubtless synonyms of Wood's species. I have specimens of *dissecta* from near the type locality and find them to agree with Wood's description as well as with those of the two authors mentioned, when Woods' description is correctly apprehended. The nineteenth segment is somewhat variable in length, its distal processes occasionally extending considerably beyond those of the eighteenth, while in other cases the segment may be wholly covered by the eighteenth in which case the latter might be readily mistaken for the former.

EXPLANATION OF PLATES.

PLATE X.

Xystocheir taibona sp. nov.

Fig. 1. Gonopods of male, caudo-ventral aspect.

Fig. 2. The same, lateral aspect.

Polydesmus bonikus sp. nov.

Fig. 3. Left gonopod of male, caudo-ventral aspect.

Titsona sima gen. et. sp. nov.

Fig. 4. Left leg of first pair, caudal aspect.

Fig. 5. Antenna.

Fig. 6. Head and anterior segments, lateral aspect.

Buwatia monterea gen. et sp. nov.

Fig. 7. Antenna.

PLATE XI.

Paraiulus tivius sp. nov.

Fig. 1. Gonopods of male, caudo-ventral aspect.

Fig. 2. Gonopods of male, lateral aspect.

Fig. 3. Third pair of legs of male.

Fig. 4. Second pair of legs of male, caudal aspect.

Fig. 5. First pair of legs of male, caudal aspect.

Fig. 6. Gnathochilarium of male.

Fig. 7. Sensory hair from lateral region of clypeus.

Paraiulus timpus sp. nov.

Fig. 8. Gnathochilarium of male.

Fig. 9. Gonopods of male, lateral aspect.

PLATE XII.

Soniphilus geronimo sp. nov.

Fig. 1. Head, dorsal aspect.

Fig. 2. Head and prehensorial feet, ventral aspect.

Fig. 3. Caudal region of body, ventral aspect.

Poabius nankus sp. nov.

Fig. 4. Right anal leg, dorsal aspect.

Paraiulus garius sp. nov.

Fig. 5. Anal scale.

Fig. 6. Caudal end of body, lateral aspect, showing anal valves, scutum, etc.

Fig. 7. Same, dorsal view.

Fig. 8. Appendages of second segment of female as seen from lateral and slightly cephalic view. First segment partly separated from the second.

PLATE XIII.

Poabius verdescens Chamberlin.

Fig. 1. Right anal leg, dorsal aspect.

Poabius iginus sp. nov.

Fig. 2. Right anal leg, dorsal aspect.

Kethops utahensis Chamb., gen. nov.

Fig. 3. Last two segments, dorsal aspect.

Fig. 4. Last segment, ventral aspect.

Fig. 5. Fourteenth ventral plate.

Fig. 6. Right anal leg, mesal aspect.